

BASF Coatings AG

Integrated painting process for automobile and commercial vehicle bodies or cabins and their replacement parts and add-on parts comprising plastic parts

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**Patent claims**

1. An integrated process for painting automobile and commercial vehicle bodies and cabins and their replacement parts and add-on parts which comprise plastic parts, wherein

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1) the metal parts of the body or cabin and/or their replacement parts or add-on parts are coated with an electrocoat material and the resulting electrocoat film is cured thermally to give the corrosion-inhibiting electrocoat;

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2) the electrocoated metal parts of the body or cabin and/or of their replacement parts or add-on parts are integrated with the plastic parts of the body or cabin, said plastic parts having

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2.1) no priming on their surface,

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2.2) on their surface, priming consisting of an electrically conductive aqueous primer coating which is cured thermally at temperatures  $\leq 100^{\circ}\text{C}$ , or

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2.3) on their surface, a partially dried but not fully cured electrically conductive aqueous primer film;

10 3) the integrated metal-plastic body or cabin are coated with an aqueous primer, where

15 3.1) the integrated metal-plastic body or cabin and its replacement parts and add-on parts whose plastic parts have no primer (variant 2.1) are uniformly coated with an electrically conductive aqueous primer and the resulting aqueous primer film is cured at temperatures  $\leq 100^{\circ}\text{C}$  to give a two-coat primer system comprising electrocoat and electrically conductive aqueous primer coat on the metal parts and a single-coat primer system comprising electrically  
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25 conductive aqueous primer coat on the plastic parts;

3.2) the integrated metal-plastic body or cabin and its replacement parts and add-on parts whose plastic parts have priming consisting of an aqueous primer coating (variant 2.2) are uniformly coated with a pale aqueous primer and the resulting pale aqueous primer film is cured at temperatures  $\leq 100^{\circ}\text{C}$  to give a two-coat primer system comprising electrically conductive aqueous primer coat and pale aqueous primer coat on the plastic parts and a two-coat primer system comprising electrocoat and pale aqueous primer coat on the metal parts;

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or

3.3) the integrated metal-plastic body or cabin and its replacement parts and add-on parts whose plastic parts have a partially dried electrically conductive aqueous primer film (variant 2.3) are uniformly coated, wet-on-wet in terms of the plastic parts, with a pale aqueous primer, after which the electrically conductive aqueous primer film and the pale aqueous primer film are jointly cured at temperatures  $\leq 100^{\circ}\text{C}$  to give a

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two-coat primer system comprising electrically conductive aqueous primer coat and pale aqueous primer coat on the plastic parts and a two-coat primer system comprising electrocoat and pale aqueous primer coat on the metal parts;

4) an aqueous color and/or effect basecoat material is applied uniformly to the primer systems and the resulting aqueous basecoat film is partially dried without curing, after which

5) at least one two-component clearcoat material is applied wet-on-wet to the partially dried aqueous basecoat film to give at least one clearcoat film; and

6) the partially dried aqueous basecoat film and the at least one clearcoat film are jointly cured at temperatures  $\leq 100^{\circ}\text{C}$ , thermally or both thermally and with actinic radiation, to give the integrated multicoat color and/or effect paint system.

2. The process as claimed in claim 1, characterized in that in step (2) of the process the electrocoated metal parts of the body or of the cabin and/or the replacement parts or add-on parts

are placed on an assembly stage (skid) on which the plastic parts of the body or cabin have already been precisely positioned.

5    3.    The process as claimed in claim 1 or 2, characterized in that in step (3.1) of the process the procedure adopted is to

10            (3.1.1)    apply a pale aqueous primer uniformly to the cured electrically conductive aqueous primer coat and to cure the resulting pale aqueous primer coat thermally at temperatures  $\leq 100^{\circ}\text{C}$

15            or

20            (3.1.2)    partially dry the electrically conductive aqueous primer film following its application, without full curing, to apply a pale aqueous primer wet-on-wet to the partially dried electrically conductive aqueous primer film, and then to cure the electrically conductive aqueous primer film and the resulting  
25            pale aqueous primer film jointly at temperatures  $\leq 100^{\circ}\text{C}$ ,

so as to result, in accordance with both variants,  
in a three-coat primer system comprising  
electrocoat, electrically conductive aqueous  
primer coat and pale aqueous primer coat on the  
5 metal parts and a two-coat primer system  
comprising electrically conductive aqueous primer  
coat and pale aqueous primer coat on the plastic  
parts.

10 4. The process as claimed in one of claims 1 to 3,  
characterized in that a lead-free cathodically  
depositable electrocoat material based on at least  
one epoxy-amine adduct is used.

15 5. The process as claimed in one of claims 1 to 4,  
characterized in that the electrically conductive  
aqueous primer comprises a component I comprising  
at least one aqueous polyurethane dispersion and  
at least one electrically conductive pigment, and  
20 at least one component II comprising at least one  
polyisocyanate.

6. The process as claimed in claim 5, characterized  
in that carbon black is used as electrically  
25 conductive pigment.

7. The process as claimed in one of claims 1 to 6,  
characterized in that the pale aqueous primer

comprises a component I comprising at least one hydroxyl-containing binder in dispersion or solution in water and at least one pale pigment, and a component II comprising at least one polyisocyanate.

8. The process as claimed in claim 7, characterized in that at least one polyester, polyacrylate, polyurethane, acrylated polyester and/or acrylated polyurethane, especially a polyurethane, is used as hydroxyl-containing binders.

9. The process as claimed in one of claims 1 to 8, characterized in that the aqueous basecoat material comprises at least one hydroxyl-containing binder in dispersion or solution in water and at least one color and/or effect pigment.

10. The process as claimed in claim 9, characterized in that the aqueous basecoat material as hydroxyl-containing binders at least one polyurethane and/or at least one acrylated polyurethane is used.

11. The process as claimed in claim 9 or 10, characterized in that the aqueous basecoat material further comprises at least one hydroxyl-

containing polyacrylate, one hydroxyl-containing polyester and/or one hydroxyl-containing acrylated polyester as additional binder(s).

5 12. The process as claimed in one of claims 1 to 11, characterized in that the aqueous basecoat material comprises at least one crosslinking agent.

10 13. The process as claimed in one of claims 1 to 12, characterized in that the two-component clearcoat material comprises a component I having at least one hydroxyl-containing binder and a component II having at least one polyisocyanate.

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14. The process as claimed in one of claims 1 to 13, characterized in that the two-component clearcoat material is curable thermally or both thermally and with actinic radiation (dual cure).

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15. The process as claimed in one of claims 1 to 14, characterized in that the cured two-component clearcoat material is overcoated with a highly scratch-resistant clearcoat.

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16. An integrated multicoat color and/or effect paint system for integrated automobile and commercial vehicle bodies or cabins and their replacement



parts and add-on parts which comprise plastic parts, comprising the following coats lying atop one another in the stated sequence:

5           1) on the metal parts, a cathodically or  
            anodically, especially cathodically, deposited  
            and thermally cured electrocoat and also an  
            electrically conductive primer coat and/or a  
            pale aqueous primer coat as the primer system,  
10           and

            2) on the plastic parts, an electrically  
            conductive aqueous primer coat or an  
            electrically conductive aqueous primer coat and  
15           a pale aqueous primer coat as the primer  
            system,

            with the proviso that the integrated automobile  
            and commercial vehicle bodies or cabins and  
20           their replacement parts and add-on parts are  
            uniformly covered over their entire surface by  
            at least one aqueous primer coat;

            and  
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            3) on the primer system of the metal parts and of  
            the plastic parts, a color and/or effect  
            basecoat, and

4) on the basecoat, at least one clearcoat.

17. The integrated multicoat color and/or effect paint  
5 system as claimed in claim 16, characterized in  
that it has been provided with a highly scratch-  
resistant clearcoat (6).
18. Automobile and commercial vehicle bodies or cabins  
10 and their replacement parts and add-on parts which  
comprise plastic parts, comprising at least one  
multicoat color and/or effect paint system  
producible as claimed in one of claims 1 to 15  
and/or at least one multicoat color and/or effect  
15 paint system as claimed in claim 16 or 17.